

# Maximum allowed internal pressure for piping tubes (according to DIN 2413 and ANSI)

ISO/metric pipes				
Outer (mm)	thickness (mm)	20°C (bar)	100°C (bar)	200°C (bar)
10	1	251	211	187
12	1	209	175	153
13	1,5	269	226	222
17,2	1,6	233	196	172
17,2	2	292	245	220
17,2	2,3	335	282	258
18	1	139	117	99
18	1,5	209	175	153
19	1,5	194	163	142
20	1,5	188	158	137
21,3	1,6	188	158	137
21,3	2	236	198	174
21,3	2,6	306	257	233
22	1	110	92	83
23	1,5	164	137	118
25	1	100	84	71
25	1,2	120	100	84
25	1,5	151	126	108
26,9	1,6	149	125	107
26,9	2	187	157	135
26,9	2,6	243	202	180
28	1	90	75	63
28	1,5	134	113	96
29	1,5	128	108	92
30	1,5	125	105	89
33	1,5	112	94	79
33,7	1,6	119	100	84
33,7	2	149	125	107
33,7	3,2	238	200	176
34	1	71	60	50
34	1,5	110	92	78
35	1,5	108	90	76
38	1	66	55	46
38	1,2	79	66	56
38	1,5	99	83	70
40	1,5	94	79	66
41	1,5	90	75	63
42,4	1,6	95	79	66
42,4	2	118	99	84
42,4	3,2	189	159	138
43	1,5	88	73	61
48,3	1,6	83	70	58
48,3	2	104	87	73
48,3	3,2	166	139	120
51	1,2	59	49	41
51	1,5	74	62	51
52	1,5	72	61	50
53	1,5	71	60	49
54	2	93	78	65

ISO/metric pipes				
Outer (mm)	thickness (mm)	20°C (bar)	100°C (bar)	200°C (bar)
60,3	1,6	67	56	46
60,3	2	83	70	58
60,3	3	121	101	85
60,3	3,6	150	126	107
63,5	1,5	57	48	40
70	2	72	60	50
73,0	1,5	52	43	34
76,1	1,6	53	44	36
76,1	2	66	55	46
76,1	3	96	80	67
76,1	3,6	119	100	84
84	2	60	50	41
85	2	58	49	40
88,9	1,6	45	38	31
88,9	2	56	47	39
88,9	3	82	69	57
101,6	2	48	40	33
103	1,5	37	31	25
104	2	48	40	33
114,3	1,6	35	29	24
114,3	2	44	37	30
114,3	3	64	53	44
129	2	39	33	27
139,7	2	36	30	25
139,7	3	54	45	37
153	1,5	25	21	17
154	2	33	27	22
168,3	2	30	25	20
168,3	3	45	38	31
204	2	25	21	17
219,1	2	23	19	16
219,1	3	34	29	24
254	2	20	17	13
273,0	2	18	15	12
273,0	3	28	23	19
304	2	17	14	11
323,9	2	15	12	10
323,9	3	23	19	16
354	2	14	12	9
355,6	3	21	18	14
406,4	3	19	16	13
457,2	3	16	14	10
457,2	4	22	18	15
508,0	3	14	12	9
508,0	4	20	17	13
609,6	3	12	10	8
609,6	4	16	14	11
711,2	3	10	8	6
711,2	4	14	11	9

ANSI (Schedule) pipes				
Outer (mm)	thickness (mm)	20°C (bar)	100°C (bar)	200°C (bar)
13,7	1,65	302	253	229
13,7	2,24	410	344	324
13,7	3,02	552	463	464
17,1	1,65	241	203	179
17,1	2,31	338	284	260
17,1	3,20	468	393	380
21,3	2,11	248	208	184
21,3	2,77	326	273	249
21,3	3,73	439	368	351
26,7	2,11	198	167	145
26,7	2,87	270	227	202
26,7	3,91	368	309	286
33,4	2,77	208	175	152
33,4	3,38	254	213	189
33,4	4,55	342	287	263
42,2	2,77	165	138	119
42,2	3,56	212	178	155
42,2	4,85	289	242	218
48,3	2,77	144	121	103
48,3	3,68	191	161	139
48,3	5,08	264	222	197
60,3	2,77	115	97	81
60,3	3,91	163	136	117
60,3	5,54	230	193	170
73,0	3,05	105	88	74
73,0	5,16	177	149	128
73,0	7,01	241	202	178
88,9	3,05	86	72	60
88,9	5,49	155	130	111
88,9	7,62	215	180	158
114,3	3,05	67	56	46
114,3	6,02	132	111	94
114,3	8,56	188	158	136
141,3	3,40	56	47	39
141,3	6,55	116	98	82
141,3	9,53	169	142	122
168,3	3,40	51	43	35
168,3	7,11	106	89	75
168,3	10,97	164	137	118
219,1	3,76	43	36	30
219,1	8,18	94	79	66
219,1	12,70	145	122	104

These values are approximative and provided for general information only.

They are based on the DIN 2413 standard for round, seamless pipes (or pipes with welding coefficient = 1.0) made from 1.4306 (304L) stainless steel.

These calculations include a 12.5% tolerance on pipe thickness.

For rolled and welded pipes, certain standards and construction regulations can impose a welding coefficient multiplier that is less than 1 (e.g. 0.8 or 0.7) in order to guarantee a higher security level by reducing the maximum allowed pressure.

For other stainless steel grades, a correction coefficient can also be applied (e.g. 1.09 for 1.4404 stainless steel).

Certain standards and building regulations impose different calculation methods to those used in DIN 2413. It is the customer's responsibility to check that their piping is suitable for the process that they will use it for and to carry out all of the necessary calculations for ensuring that their installation will work correctly.

## Relationship between Maximum Allowed Pressure and Nominal Pressure

- The PN (Nominal Pressure) corresponds to the operating pressure at 20°C
- Industrial usage:  $MAP = 1.5 \times PN$  so  $PN = 2/3 \times MAP$
- Maritime usage:  $MAP = 2 \times PN$  so  $PN = MAP/2$

**Example:** PN calculation for a Ø26.9x2 rolled and welded pipe for industrial usage

MAP given by the table: **187 bar**

for the rolled and welded pipe you need to use a welding coefficient:  $MAPr/s = 187 \times 0.7 = 130.9$  bar so  $PNr/s = 2/3 \times 130.9 = 87$  bar